

Abstract

Effect of Pomegranate Extract and Tangeretin on Specific Pathways in the Rat Breast Cancer Model Induced with DMBA [†]

H. Fatih Gul ^{1,*}, Necip Ilhan ¹, Nevin Ilhan ¹ and I. Hanifi Ozercan ²

¹ Department of Medical Biochemistry, Faculty of Medicine, Firat University, Elazığ 23000, Turkey; necipilhan@hotmail.com (N.I.); drnilhan@yahoo.com (N.I.)

² Department of Medical Pathology, Faculty of Medicine, Firat University, Elazığ 23000, Turkey; ozercan@firat.edu.tr

* Correspondence: fth_2323@hotmail.com; Tel.: +90-424-237-0000

[†] Presented at the 2nd International Conference on Natural Products for Cancer Prevention and Therapy, Kayseri, Turkey, 8–11 November 2017.

Publish: 13 November 2017

Abstract: It was aimed to investigate the possible chemopreventive effects of Pomegranate extract (PE) and Tangeretin (TAN), in the rat breast cancer model induced with 7,12-Dimethylbenz[a]anthracene (DMBA), on the selected angiogenesis parameters and NF-κB pathway. 56 Sprague Dawley female rats separated into 8 groups. Group I was control, Group II, III and IV were treated with PE, TAN and PE+TAN respectively. Group V was administered with DMBA, Group VI, VII and VIII also received PE, TAN and PE+TAN. The presence of the breast tumour tissue was demonstrated with histopathological examinations. Plasma VEGF, MMP-9 and NF-κB levels were determined using the ELISA method. As a result of the histopathological evaluations, it was determined that most (90%) of the tumors created were invasive ductal carcinoma. When compared to the controls, increased plasma VEGF, MMP-9 and NF-κB levels were determined in the DMBA group ($p < 0.001$; $p < 0.05$; $p < 0.001$). While quite significant decreases were observed in plasma VEGF and NF-κB levels in Group VI, Group VII and Group VIII compared to the DMBA group ($p < 0.001$; $p < 0.001$), decreases in MMP-9 levels were statistically insignificant. It was suggested that PE and TAN have chemopreventive effects on the development of breast cancer by effectively inhibiting both angiogenesis pathways and NF-κB pathway due to many natural bioactive agents they contain.

Keywords: Breast cancer; DMBA; Pomegranate extract; Tangeretin



© 2017 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).